TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Nathan Canaris, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: June 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: June 30, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on June 10, 2015 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, downloaded the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms and photo documentation of the site visit are attached to this report.

One bag of trash (paper, plastic bottles, etc.) were picked up from around the fence line in various areas. The trash was disposed of in the local technician's office dumpster.

Attached with this report are preliminary drain time analyses for the surface sand filter using data from the barometrically compensated Solinst® level logger which was installed in the detention basin in September 2014. The precipitation data is provided by the USGS from a heated rain gauge located approximately five miles from the site in Middlesex, NJ.

MANPOWER REPORTING

Date	LATA Labor
June 10, 2015	Approx. 2.5 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

None

PLANS FOR NEXT MONTH

Plans for the June 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger.

350446

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted **X** **Monthly**

Quarterly _____ **Annually** _____ **After 1" or Greater Rainfall** _____

Inspection Date: **6/10/2015** **Weather** **Sunny, 70s**

Inspectors Name **Sunil Samaroo**

Basin Inspection:

	Yes	No	N/A
Catch Basins (23 Structures)			
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? _____
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

5. Does the basin have pooled or standing water?	X		
6. What is the water height **4 to 6 inches**			
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?			X

If yes, describe where **Water was observed in all 3 detention basins**
Approximately how many hours was the last rainfall? _____
How many inches of rain? _____
If yes, describe where _____

Woody vegetation was removed by pulling/cutting at ground level around the top of the detention basins.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water?		X	
If yes, describe where _____			
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures?		X	
If yes, describe where _____			
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Subcontractors are on-site performing repairs to damaged areas in the asphalt.

Inspector's Signature Sunil Sumaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **6/10/2015** **Weather** **Sunny, 70s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms?		X	
If yes, describe:			
2. Is there an accumulation of tree debris?		X	
If yes, describe:			
3. Do any trees appear infested?			X
If yes, describe:			
4. Do any trees appear malnourished?			X
If yes, describe:			
5. Was the last Quarterly Seasonal Maintenance Performed?			X
Date of previous maintenance:			
(Refer to section 2.3.2 of the Operation & Maintenance Manual)			
6. Was the last Annual Arborist Inspection performed?			X
Date of previous inspection:			
(Refer to section 2.3.3 of the Operation & Maintenance Manual)			

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **6/10/2015** **Weather** **Sunny, 70s**

Inspectors Name **Sunil Samaroo**

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Asphalt has minor cracking predominantly at seems, previously observed.
Subcontractors are on-site performing repairs to damaged areas in the asphalt.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water?			X
If yes, describe where _____			
2. Are there any signs of cracking?	X		
If so, note location and maintenance effort below.			
3. Are there any signs of disintegration?			X
If so, note location and maintenance effort below.			
4. Are there any sins of distortion?			X
If so, note location and maintenance effort below.			
5. Has all vegetation been removed?	X		
If applicable, note location of vegetation below			
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X
When was date of the last CPM treatment? _____			
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)			

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Subcontractors are on-site performing repairs to damaged areas in the asphalt.

Inspector's Signature Sunil Sharma

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: _____

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: _____
Stop: _____
Inches of Rainfall: _____

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

_____

_____

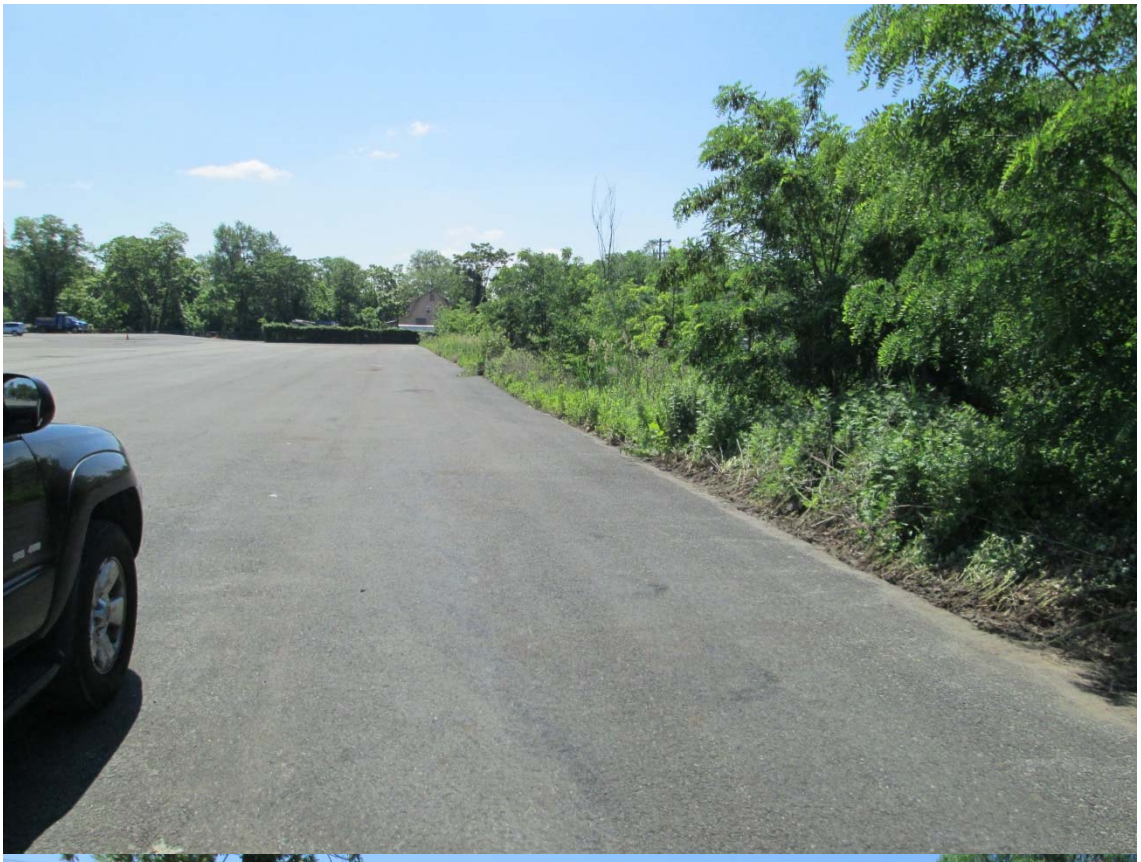
_____
Inspector's Signature

06-10-2015 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos

Additional site photos



Preliminary Surface Sand Filter Drain Time Analysis

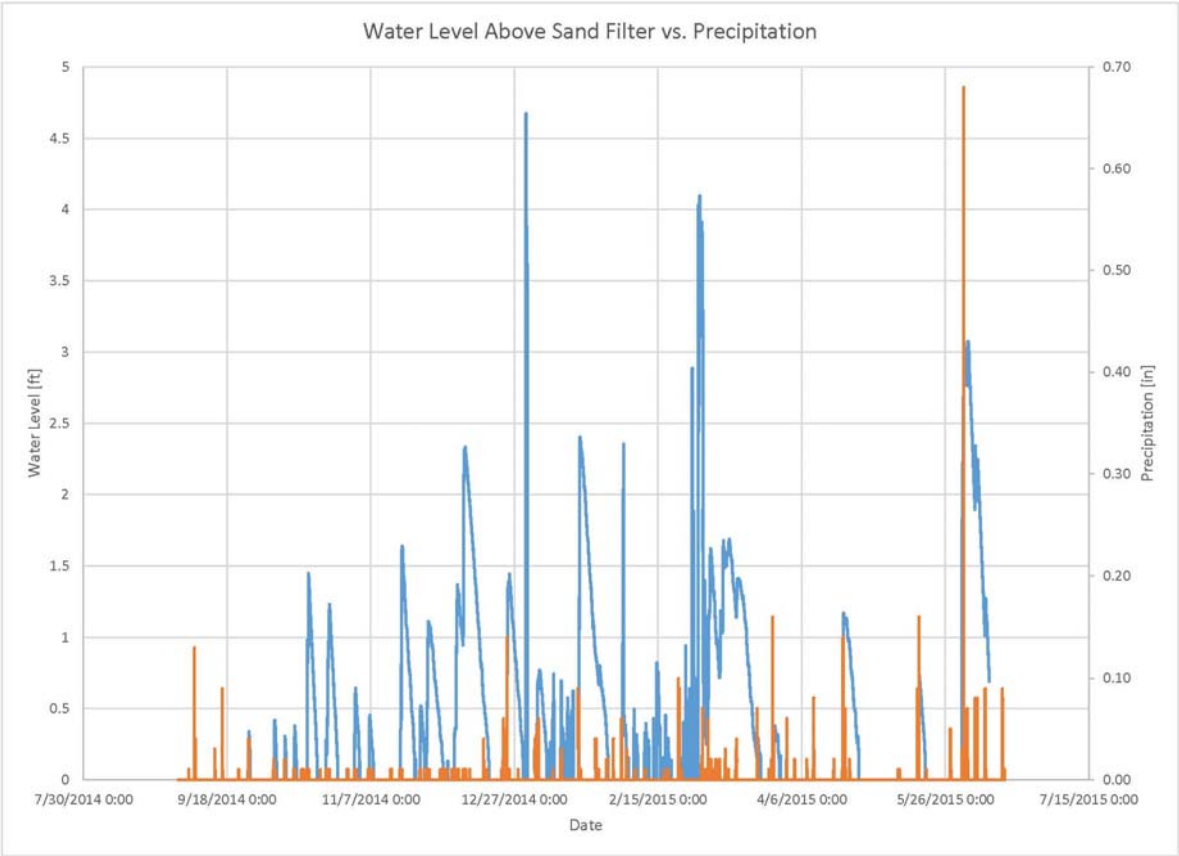


Figure 1. Timeseries of water level above the sand filter versus precipitation.

The full timeseries of water level above the sand filter versus precipitation measured at the rain gauge in Middlesex, NJ is presented in Figure 1. Individual precipitation events and their associated drainage times are presented below.

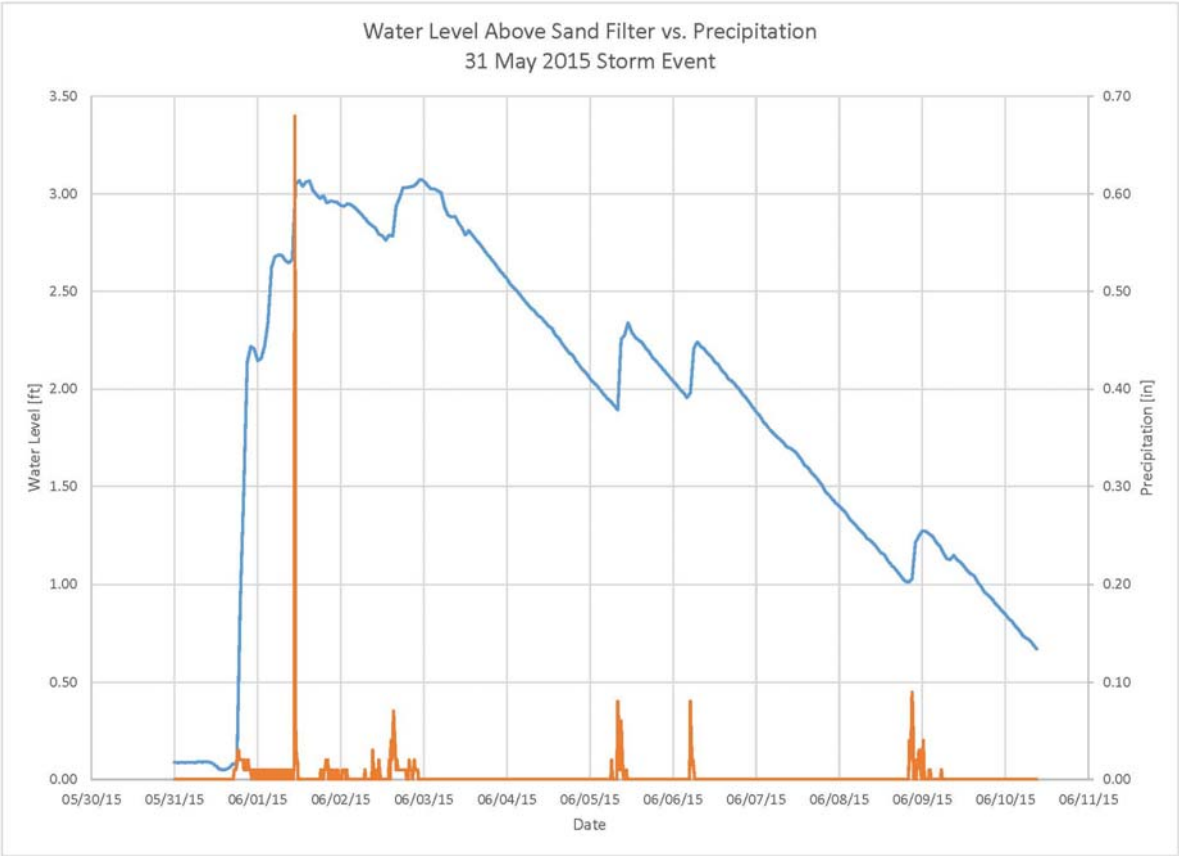


Figure 2. Sand filter drainage time for 31 May 2015 Storm Event.

During the period 31 May 2015 – 2 June 2015, the site received the largest amount of precipitation recorded since the pressure transducer was installed in the detention basin in September 2014. Figure 2 shows the water level above the sand filter along with precipitation data from the rain gauge in Middlesex, NJ. Twenty-four hour precipitation totals are listed below in Table 1.

Table 1. Twenty-four hour precipitation totals, 31 May 2015 – 2 June 2015

Date	Total Precipitation [in]
5/31/15	0.36
6/1/15	1.08
6/2/15	0.67

During this period, the highest rain rate recorded was 0.78 inches in a two hour period on 1 June. This is below the design storm event of 1.25 inches in a two hour period.

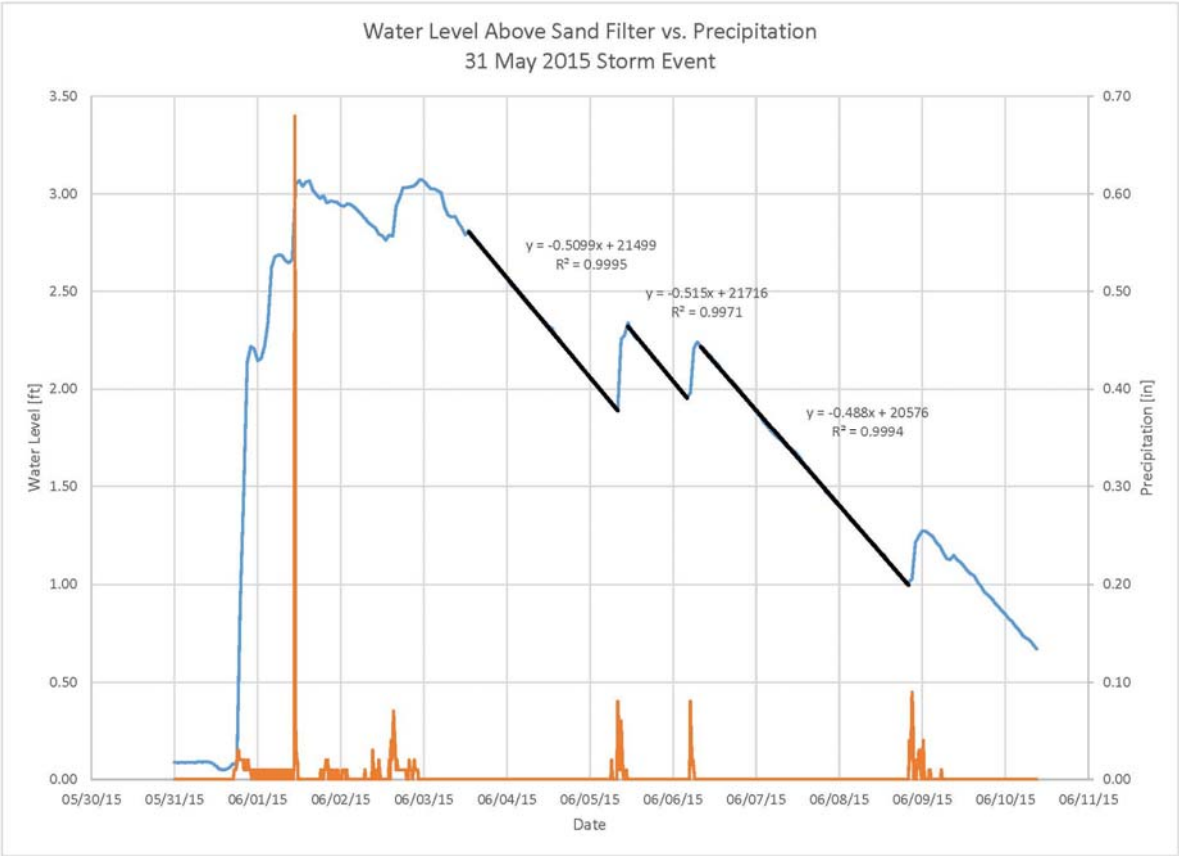


Figure 3. Sand filter drainage time for 31 May 2015 Storm Event with linear regressions during drainage.

Figure 3 includes three linear regressions fitted to the water level above the sand filter between precipitation events while the sand filter is draining. These regressions show that the sand filter has an average drain rate of approximately 0.5 ft/day.

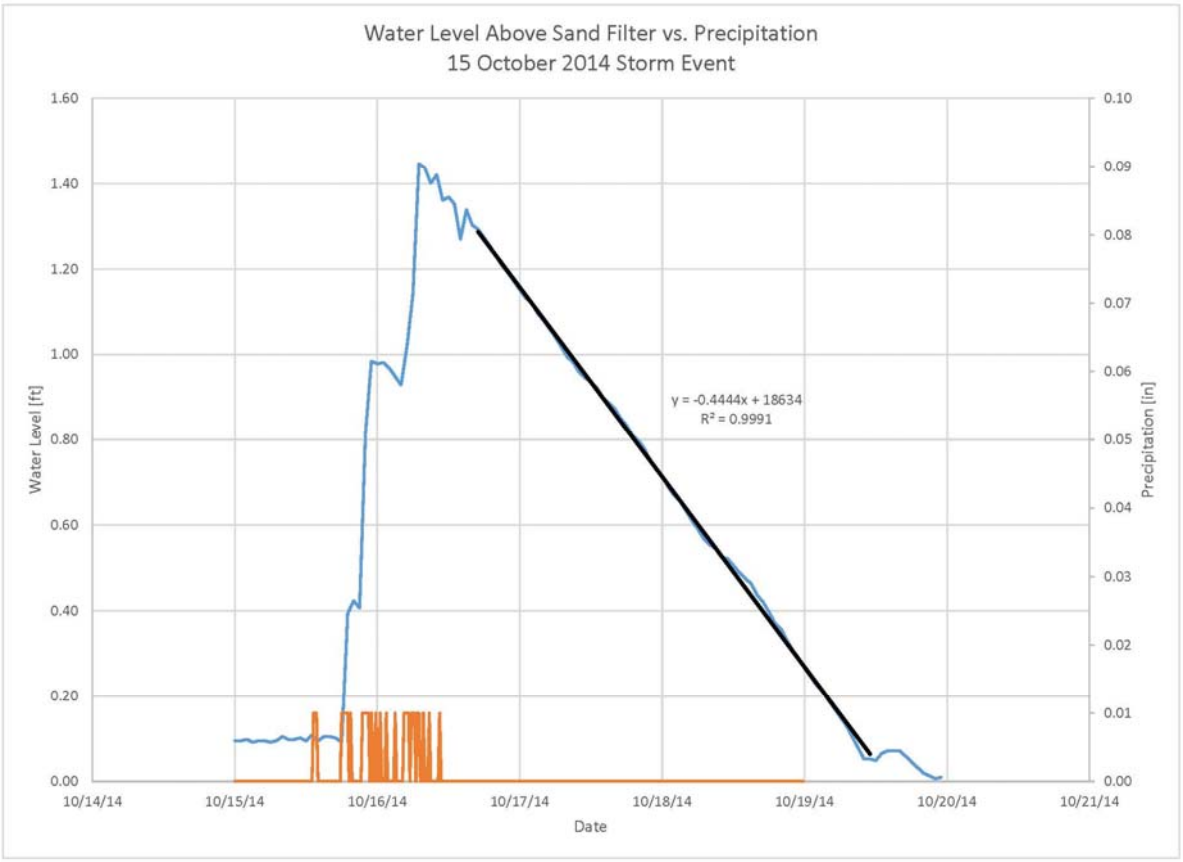


Figure 3. Sand filter drainage time for 15 October 2014 Storm Event with linear regression during drainage.

Figure 3 includes a linear regressions fitted to the water level above the sand filter after precipitation on 15-16 October while the sand filter is draining. This regression shows that the sand filter has an average drain rate of slightly less than 0.5 ft/day.

From the New Jersey Stormwater Best Management Practices Manual, Equation 9.9-1:

$$A_S = \frac{(V_{QS})(TH_S)}{[(k)(\frac{D_{ST}}{2} + TH_S)(T_D)]}$$

Equation 9.9-1

Where:
A_S = Minimum Sand Bed Surface Area (in square feet)
V_{QS} = Runoff Volume from the Stormwater Quality Design Storm (in cubic feet)
TH_S = Thickness of Sand in Sand Bed (in feet)
k = Sand Bed Design Permeability (in feet per day)
D_{ST} = Maximum Temporary Sand Bed Depth (in feet)
T_D = Sand Bed Drain Time (in days)

Solving for the Sand Bed Drain Time (T_D) and using the values and/or actual measurements below,
A_S = Minimum Sand Bed Surface Area = 9,660 ft^2
V_{QS} = Runoff Volume from the Stormwater Quality Design Storm = 82,621 ft^3
TH_S = Thickness of Sand in Sand Bed = 2 ft
k = Sand Bed Design Permeability = 4 ft/day
D_{ST} = Maximum Temporary Sand Bed Depth = 3.5 ft

T_D = .88 days or 21.1 hours

Equation 9.9-1 (Operation & Maintenance Plan, Cornell-Dubilier Electronics Superfund Site, Operable Unit 2, Appendix A) presents the design parameters for the sand bed from which it is calculated that runoff from the design storm event should drain in 21.1 hours.

Using data from the 31 May – 2 June precipitation event (Figures 1 and 2) the peak water level above the sand bed for this precipitation event was 3.07 feet at 2300 hours on 2 June 2015. Using the minimum sand bed surface area (A_s) from Equation 9.9-1, and multiplying by 3.07 feet this equates to approximately 29,656 ft^3 of water. Solving for T_D yields a sand bed drain time of 9.8 hours.

As shown in Figure 2, the sand bed had only drained down to a water level of 1.89 feet (net change of 1.18 feet) before the next precipitation event started at 0615 on 5 June 2015, with an average drainage rate of 0.5 feet per day.

This data suggests that the current permeability of the sand bed is significantly less than the design permeability of 4 ft/day.